

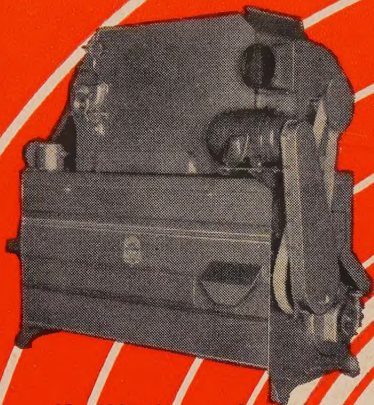
NOVEMBER  
1951

Few plants have the magnificent scenic setting of this one in Utah. It is the Globe Mills Div. of Pillsbury Mills, Inc. Grain storage capacity 2,300,000 bus.

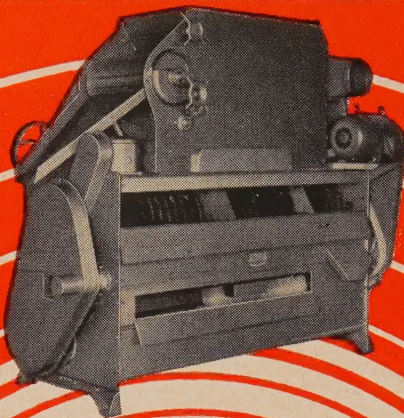
# Grain

THE MAGAZINE OF PLANT MANAGEMENT AND OPERATION





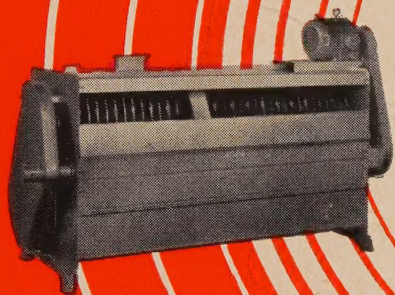
No. 2131, drive end



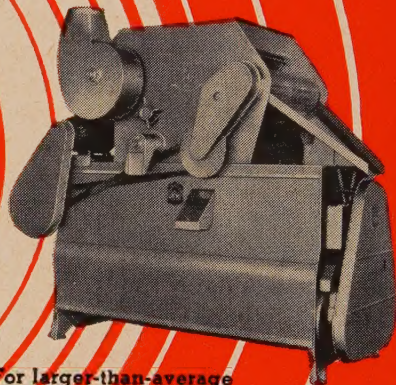
For moderate capacity, the No. 2131 with motor drive, feed end.



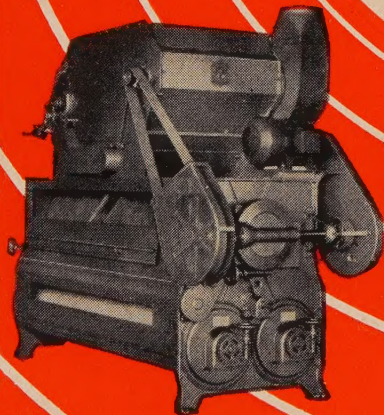
For difficult mixtures, the No. 2133, feed end



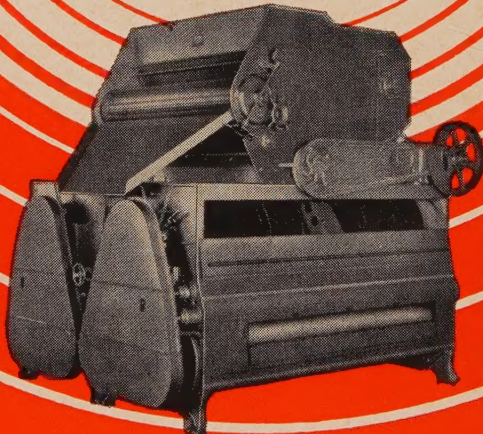
No. 2133, without scalper or aspirator



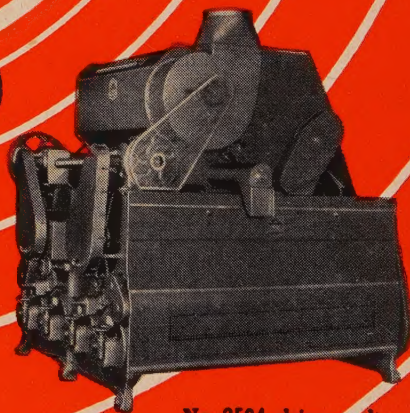
For larger-than-average capacity, the No. 2532 with motor drive, feed end



No. 2532, drive end



For large capacity, the No. 2564, feed end



No. 2564, drive end

### TYPICAL SEPARATIONS

**From Wheat:** cockle, wild buckwheat, wild peas, pigeon grass, mustard, oats, wild oats, barley.

**From Rye:** cockle, wild buckwheat, wild peas, pigeon grass, mustard, oats, wild oats, long barley.

**From Malting Barley:** wheat, seeds, cross-broken and peeled barley, oats, wild oats, Trebi barley.

**From Oats:** wheat, rye, durum, cockle, wild peas, mustard, wild buckwheat, pigeon grass, pin oats, barley.

**From Orchard Grass, Fescues, etc.:** dodder, dock, sorrell, ox-eye daisy, Johnson grass, water grass, clovers, small bulb onion, buckhorn, cheat, chess, long straw.

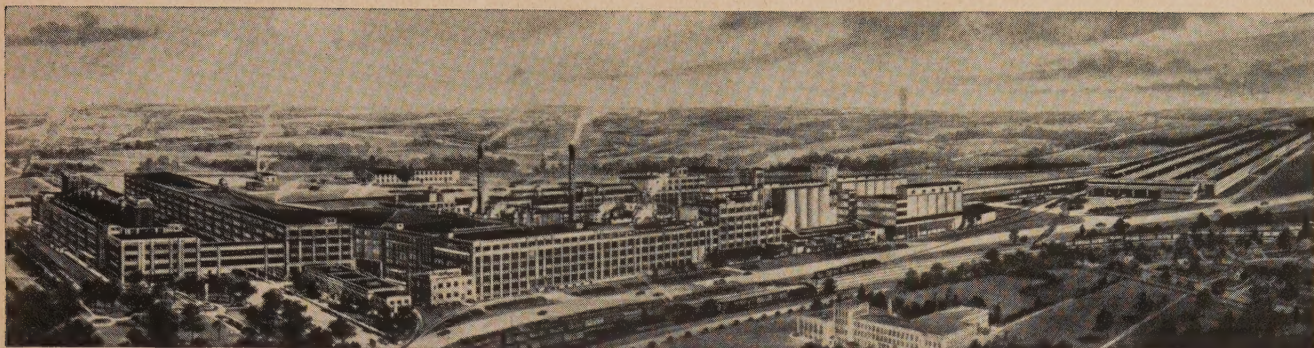
**Mixed Grains:** Any small grains that differ in length.

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From a small one-room corn flakes plant, operated by W. K. Kellogg, soon after the turn of the century, has sprung the Kellogg world wide ready-to-eat-cereal enterprise with plants in Battle Creek, Michigan; Omaha, Nebraska; Canada; Great Britain; Australia; South Africa, and Mexico. Today, the Kellogg Company manufactures nearly a dozen different ready-to-eat-cereals, and in addition, dog, poultry and stock feeds. Kellogg products are known and distributed throughout the world, and the company has become known as the "Largest Ready-To-Eat-Cereal Company in the World."

## DAY EXPERIENCE CAN SOLVE YOUR DUST CONTROL PROBLEMS

This achievement record, plus the experience gained by The DAY Company in engineering, manufacturing and installing dust control systems for mills, elevators, food plants since 1881 is of great importance to you. It means that when you call upon DAY, you benefit from their 70 years'

In a recent modernization program at Kellogg's large Battle Creek, Michigan plant the DAY Company was selected to engineer, manufacture and install dust control, material handling and storage equipment. The total project included the following:

### DUST CONTROL FOR CORN AND WHEAT CLEANING:

A turn-key job which included self-cleaning DAY Type "AC" Dust Filters with proven dust collection efficiencies of 99.99% and better; the widely accepted DAY Dual Clone Dust Separators which assure maximum centrifugal dust separation, and DAY Exhausters designed for highest efficiency in dust control applications.

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**CEREAL STORAGE:** For use in the storage of Rice Krispies, DAY fire and vermin proof, non-bridging bulk storage bins were supplied. These bins are furnished in either heavy, galvanized black iron or stainless steel.

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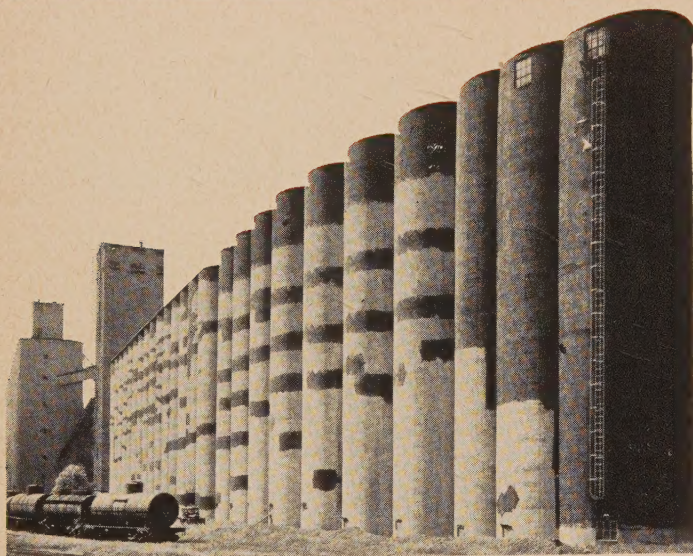
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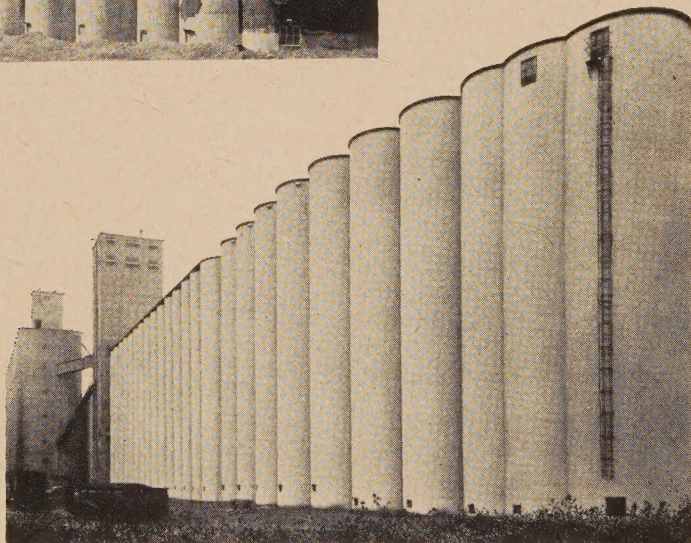


# ***Protecting America's Grain...*** **by Repairing and Waterproofing** **GRAIN ELEVATOR CONSTRUCTION**



**BEFORE**

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**COMPLETED**

Here you see the decorative and light reflecting finish. Under this is our pliable type of waterproofing.



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 CORPORATION



# Late Research in Soybean Products

By DR. J. C. COWAN  
*Northern Regional Research  
Laboratory — Peoria, Ill.*

**D**URING the past 15 months our country has been involved in the Korean conflict. This necessitated some changes in our research. Changes in research goals usually prolong or lengthen the period required to obtain new information and developments. However, the impetus of our past research carried us along so that we do have new accomplishments to report.

These accomplishments came as a result of our work on flavor stability, soya flour, lecithin, and soybean oil. Much of this work was made possible by funds appropriated as a result of the Research and Marketing Act of 1946.

## Repeating Experiments

Remember that the basis of scientific process is the reproducible experiment. It is necessary for the researcher to proceed carefully. He must of necessity repeat every experiment he does; perhaps, some uncontrolled factor was responsible for his success or failure. Controlled variables must be studied to determine optimum procedures. This takes time!

In other words, what are the basic ingredients in research at the Northern Regional Research Laboratory? They are the basic ingredients in industrial research. They are fundamental or scientific research, development, and invention. These components of technical progress must be harnessed together in a sustained common effort, and the common effort kept headed in the right direction. Our emphases or direction in research varies some from the conventional industrial one, but major goals are similar.

Fundamental research gives us the basic information which is needed concerning the properties of oil, proteins, carbohydrates, and other products which are grown in the crop each year by the farmer. With the fundamental knowledge concerning our commodities, we can develop processes for converting them into useful items, such as soybeans into salad oil or paint oil, or develop new products. Some of our developments include inventions which can be patented. Since we work for all Americans, and particularly the farmers, we apply for patents to be assigned to the Secretary of Agriculture.

## Flavor Stability of Soybean Oil

Much of the work which we have carried out on the flavor stability of



At the left are the electrically heated rotary hearth baking oven and the sheeting rolls for uniformly degassing bread doughs. Dr. C. W. Ofelt, Chemist, is shown scaling a dough to a definite weight prior to placing in the pan at lower right and fermenting in the constant temperature—constant humidity cabinets in the background. It is through visual observation and feel of the doughs during such manipulations that the operator must evaluate dough-handling characteristics.

soybean oil has been fundamental in character. This work has led to some developments and inventions, but much of our work has increased the sum total of available knowledge concerning the problem. What are our accomplishments in this problem?

First, we have demonstrated by carefully controlled experiments and cooperative effort that taste panels can judge oils objectively and show differences between oil samples. Many concerns in the edible oil industry are now using our procedures. In fact, 12 firms are co-operating with us in further study on this important tool.

## Metals in Oils

Another tool which we developed came as a direct result of fundamental information which we uncovered. We found that metals were vitally important impurities in edible grades of soybean oil. Indeed, as little as 0.1 part per million of iron and 0.01 part per million of copper were found to be enough to reduce the flavor stability of soybean oil.

Our Analytical and Physical Chemical Division developed an improved method for analyzing metals in oils. With this method, we were able to show, in a survey of commercial oils, that significant amounts of iron and copper were present.

What can be done about these metals? We, and others, have found that many compounds, when added to

soybean oil in amounts of 0.01%, act as metal inactivators and improve the flavor stability of soybean oil. Now, most of the industry is either using metal inactivators during deodorization of the oil or adding them just afterwards. We believe that metal inactivators should be present during deodorization and afterwards. In their presence, superior results are obtained.

## Inactivators

Among the new metal inactivators which we have recently investigated and found to improve soybean oil are: Phytic acid, iminodisuccinic acid, and starch phosphate. Another important factor was also firmly established in our survey of commercial oils. Many edible soybean oils cannot be successfully deodorized in iron equipment unless a metal inactivator is used. Furthermore, high vacuum and proper handling is necessary to obtain bland oils. Commercial soybean salad oil of good quality is now being manufactured using metal inactivators and improved deodorization techniques.

## Flavors from Linolenic Acid

Our fundamental studies on the flavor stability of soybean oil have shown that linolenic acid is one major factor involved. A number of investigators have attempted to establish this relationship but none of them were able to give clear-cut evi-



# Grain

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dence to support the theory. However, by some techniques not previously used on this particular problem, we were able to show that the presence of linolenic acid in cottonseed oil made its flavor indistinguishable from soybean oil.

What we did was to insert into the cottonseed oil molecule linolenate and linoleate radicals and let our taste panel tell which sample was cottonseed oil. Soybean and cottonseed oil were identified correctly, and the sample of cottonseed containing linolenic acid radicals was also identified as soybean oil.

Additional work on the autoxidation of linolenic acid has shown that the initial products of the autoxidation are dimers; i.e., compounds in which two molecules of linolenic acid have reacted together. However, these dimers are strangers to the ordinary dimers or other oxidation compounds. Although prepared at freezing temperatures, the dimers have a portion of the molecule cleaved off. Apparently, the undesirable flavors from linolenic acid are formed in the very early stages of oxidation.

Recently we have been investigating these volatile oxidative cleavage products or "flavors" from soybean oil and methyl linolenate and have found some new, heretofore-unreported products. Some of the same a,B-unsaturated aldehydes have been found in the flavors from both soybean oil and linolenic acid. I am happy to report that this discovery removes some of the mystery from the scientific aspects of the "reversion" problem.

### Co-operative Work Continues

Our work on the flavor stability of soybean oil is being augmented by additional research at the University of Pittsburgh and the University of Illinois. Both universities have contracts from the Agricultural Research Administration on Research and Marketing funds on parts of the flavor stability problem which are being supervised by the Northern Laboratory. We are working together with them to obtain a better understanding of the problem.

The work at Urbana has only just started. They are extending the research on the role of linolenic acid in the stability of soybean oil with particular attention to its polymers. The work at Pittsburgh was reported a year ago. Their main efforts this year have been concentrated on isolinoic acid.

This phase of the work has not progressed enough to give a report on it. However, we are sure that we will soon have interesting information on the flavors derived from this acid. This contract is primarily concerned with shortening since isolinoic occurs in large quantities in shortening but does not occur in the liquid oil.

Soybean "lecithin" is now well established as a commercial product.

It has widespread uses in foods, feeds, and pharmaceuticals. In most products for consumer use, it is a minor constituent. Thus in a wide variety of foods, such as margarine, chocolate, candies, prepared drinks, ice cream; and in industrial products, such as paints, resins, and pigments, it is present to the extent of a few tenths of a per cent. In these products, one of its major roles is that of a dispersing agent.

### Lecithin Modified

Approximately 6 months ago, we offered samples of chemically modified soybean lecithin to industry for their investigation of end uses. Many companies asked for samples. A recent request to these same companies for information concerning their interests indicates that this new derivative has possibilities. It is too soon to know if these interests will be maintained sufficiently to bring commercial use. However, the future of lecithin modified with phenyl isocyanate appears promising now.

Our work on phosphatides has also included fundamental work which has led to a partial clarification of the mysteries surrounding the composition of soybean lecithin. Less than 5 years ago, the trade believed that soybean phosphatides consisted of 65% lecithin and 35% cephalin. As our studies showed, the phosphatides actually contained approximately 30% lecithin, 30% cephalin, and 40% inositol phosphatides. Again it was necessary to apply new techniques to the problem, but our initial work made an excellent foundation for more work by ourselves and others.

As our knowledge increases concerning the chemical, physical, and biological properties of the individual phosphatide components of commercial soybean lecithin, there is increasing interest in the fractionation and isolation of the individual components. In fact, commercial investigations are following fast upon the heels of recently developed fundamental knowledge concerning the composition and properties of the phosphatides. Pharmaceutical uses in connection with atherosclerosis and the intravenous feeding of fats are currently supplying an impetus to isolate the components.

In anticipation of this trend, work was begun a year ago at the Northern Laboratory to investigate practical commercial solvents and minimal solvent-to-phosphatide ratios for phosphatide separations. This work, incidentally, has been carried on by Miss Turid Wik of Oslo, Norway, who elected to come to the Northern Regional Research Laboratory to study phosphatides under support of the International Study Grant Program of the American Association of University Women. Isopropyl alcohol has been given the most study of the commercially practicable solvents, and it appears to give useful fractionation. This work is now being (Please turn to Page 20)

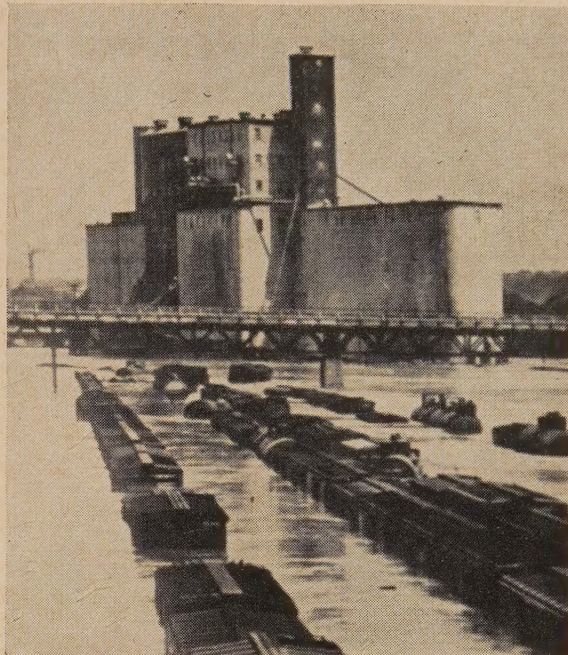


The Rock Island Elevator, directed by Mr. Darbe, which was located in the path of greatest flood and major destruction.

# The Kansas City Flood—As I Saw It

By CLAUDE L. DARBE

*Elev. Supt., Simonds-Shields-Theis Grain Co.,  
Kansas City*



THIS is an attempt to give an eye-witness story of the disastrous Kansas City flood of 1951 for the benefit of fellow SOGES members and other readers of GRAIN. Many of the incidents defied the wildest flights of imagination and left tragedy and huge loss in their wake.

Buildup in the Kaw River began early in the summer and rains became heavier until many Kansas towns were flooded and farms were severely damaged just as wheat harvest time drew near. Topeka, Manhattan and Lawrence had been flooded over a considerable part of their lower sections and the river was nearly full to its mouth but in Kansas City we sat behind 35 ft. dikes and felt quite secure.

On about July 10 we read of 4 to 6 inch rains in the Kaw watershed and our confidence changed to hope. As volunteers worked on the dikes we waited and watched. At the Rock Island Elevator we continued operations through the day until 4:30 p.m. July 12, with reasonable assurance that the dikes would hold the water. Some of the residents of Armourdale were moving property and merchandise to higher ground but it was a few hours later when the situation became serious and orders came to evacuate. Many moved but others just laughed and remained.

At 11:50 p.m. the water went over into Argentine inundating the residential and business sections where the Santa Fe Elevator is located.

At 5:28 a.m. Friday the 13th, it came over into Armourdale and swept into Standard Mill and Wyandotte Elevator and came east toward the Rock Island Elevator where I had spent the night. At 6:40 the first water came into view as oil barrels could be seen floating across Coy St. at Shawnee and at 6:50 it crossed 7th Street on Kansas Ave.

A short time later, George Herold, C. E. Whitham and myself went to the gallery, which is 110 ft. from the ground, to spend a few days, for reasons not pertinent to this story. From this vantage point we witnessed a scene of horror that has seldom been equaled in the history of America.

The water came quietly at first and appeared to be harmless until it built up sufficient power, then it became a tornado in slow motion, twisting, crushing, and destroying nearly everything within its reach. Homes and business buildings were floating like corks. Others were crumbling or being dashed to pieces by the mighty force. Empty box and oil cars floated while those that were loaded were completely submerged. Lumber yards, tanks, groceries, animals and all kinds of debris from farms and cities floated on the flood and added weight to its destructive power.

True to custom, men with motor boats were risking their lives going everywhere possible to rescue those who had laughed at the warnings. About 3:00 p.m. Frank A. Theis told us to leave the building and we joined those who watched from the banks.

Then began the anxious days of waiting and trying to formulate plans for rehabilitating the machinery and building. We could see the great holes blown in Section "C" at about 4:30 a.m. on July 14th, and debris piled against the unloading shed and power house. There were several carloads of everything that a river can find, piled in places where it certainly was not wanted.

Later the dike broke and flooded the Fairfax district where the River Rail, C.G.W. and Fairfax Elevators were located. Severe damage was caused.

When the police gave permission to go into the flooded district the

sight that met our eyes was frightening. The mud was so deep that it was almost impossible to wade through. It had drifted like snow from 1 to 6 feet deep, in and outside of buildings.

The Rock Island Elevator was surrounded with mud, debris, grain and water and the work floor, tunnels and basements had from 2 to 10 feet of the same. The office had 2½ feet of mud even on the second floor.

This can only be fully appreciated by those who went in and cleaned up the appalling mess. It was caused by water 18 feet deep at the west end, and 24 feet at the east end of the building.

Armourdale was dead! The green tops of trees and two horribly starved dogs were the only reminders that life once existed there. Men, women and children came and tried to dig some of their possessions out of the drifted remains that they found. Almost every thing that had not been destroyed by the power of the water had been made worthless by the filth.

The flood of 1951 had been the worst in the history of Kansas City. The crest was 43.9 feet at the Kansas Ave. bridge and 51 feet at 23rd St. where the ground is lower. There was 60% more water coming down the Kaw than in 1903.

In spite of difficulties, the streets have been cleared by bulldozers and much of the unwanted remains trucked away, and a few blades of green grass wave gayly as we move about in this spot of almost unbelievable horror.

Armourdale is now living again. A few businessmen are ready to open their doors to serve their customers and some home owners are repairing their houses and will try again where they call home. This is true in spite of the fact that about 80% of the homes were condemned. The city is



# EXTRA CAREFUL HANDLING

## Moisture, Blight, Bugs to Cause Losses

ABOUT 25 members of the Chicago ASOGES Chapter drove to Milwaukee on Friday, Oct. 12 where they spent the afternoon inspecting the new malting and grain elevator facilities of the Froedert Grain & Malting Co.

Company guides escorted the visitors through the "world's biggest malt plant" and explained the various steps in the transformation of barley into malt.

At the conclusion of the tour a movie was shown in the auditorium of the company's beautiful new headquarters which depicted the story of malt from the barley field through the final processing operations.

Afterwards Kurtis Froedert, president of the firm, entertained the visitors in the beautiful recreation parlor where they were permitted to sample a large variety of beers made from Froedert malt.

As a special favor Mr. Froedert also gave the group a look at his fabulous private office which is said to be one of the most outstanding in the country. It is impossible to describe the beauty and decor of this room in words and one would not expect to find anything comparable to it outside of Hollywood.

Elaborately furnished with oriental rugs, and objects of art, it also boasts a concealed multicolored lighting system, private bath and bar.

Still slightly awed with all this splendor, the Chicagoans adjourned to the Maryland Hotel for dinner and a short business meeting.

Guests at the meeting included Jim Auld, veteran secretary of the Minneapolis Chapter; Dr. John Parker, director of the Midwest Barley Institute, Milwaukee; and T. A. Strid, Green Bay, Wis.

Dr. Parker pointed out that the heavy rains this Fall had resulted in a high moisture barley crop which requires extra careful handling — the

same is true of wheat and corn, he added.

He also told the superintendents that not all the trouble in barley this year was visible to the eye. The blight factor is an indeterminable quotient and the insect problem will probably be the worst in many years, he predicted.

"However, there is still plenty of good barley back on the farm," Dr. Parker said. "Of course the poorest barley is being shipped first but you will see plenty of good grain on the market before next May."

The group also paid tribute to Hester Desch, who after serving for over two years as Dean Clark's "Girl Friday", resigned her post effective Nov. 1. Mrs. Desch, who has been one of the "spark plugs" in the Chicago chapter ever since she joined the executive secretary's staff, will make her home on the West Coast of Florida where she and her husband plan to raise pedigreed beagle hounds. Her address will be Box 408, R.F.D. No. 1, New Port Richey, Fla.

### Arizona Firm Wins National Award

Judges recently selected Advance Seed and affiliated Allied Grain Companies' direct mail campaign as "Best



Archie Kroloff, (left), Vice-Pres., Advance Seed Company, Phoenix, Ariz., and Frank Mangelsdorf, Advertising Director, look over "Best in Industry" direct mail campaign for 1951.

of Agricultural and Supplies Industry for 1951". First public announcement and certificate was awarded at

the opening breakfast meeting of Direct Mail Advertising Assn., Inc., a national organization, at its 34th annual conference on Oct. 17 at Milwaukee, Wis.

The Phoenix, Ariz. seed and grain firms' complete direct mail campaign for the year ending Aug. 31, 1951, was exhibited at the conference. Six additional copies of the campaign for traveling exhibits will eventually be placed in the association's library in order that members anywhere in the United States and Canada may send for a copy of winning entries on a loan basis.

Frank Mangelsdorf, member of the Phoenix Advertising Club in Arizona, is director in charge of all advertising for the seed and grain firms.

### HAPPY BIRTHDAY

We extend cordial birthday greetings and felicitations to the following whose natal dates are in December:

Dec. 2 — Roy E. Gorgen, The Day Co., Minneapolis

Dec. 6 — Jas. L. Brown, Pillsbury Mills, Inc., Atchison, Kans.

Dec. 11 — Dr. B. N. Smallman, Science Service Division, Dept. of Agriculture, Winnipeg, Man.

Dec. 13 — O. W. Rowe, Uhlmann Grain Co., Kansas City, Mo.

Dec. 17 — Oerlin W. Randall, Mill Supt., Calvert Distilling Co., Elkridge, Md.

Dec. 18 — Wm. Gassler, Calumet Elevator, Norris Grain Co., Chicago.

Dec. 18 — John T. Goetzinger, Rosenbaum Brothers, Omaha.

Dec. 19 — Norman Broadway, Collingwood (Ont.) Terminals, Ltd.

Dec. 26 — Roy L. Herod, Langdon Supply Co., Kansas City, Mo.

Dec. 27 — Herbert C. Brand, retired, Quaker Oats Co., Cedar Rapids, Iowa.

Dec. 30 — Claude L. Darbe, Simonds-Shields-Theis Grain Co., Kansas City, Kans.

Dec. 31 — James Auld, Hales & Hunter Co., Minneapolis.

Dec. 31 — Lloyd E. Forsell, Albert Schwill & Co., Chicago.

Please help us to complete our records by sending in your birthdate or that of another "Grain" reader.

"Young man about to be married, seeks older man to dissuade him from idea."—Ad in Mexico City paper.

repairing the dikes and a series of dams is being considered to impound the water in the Kaw drainage area in the hope that such disasters can be averted in the future.

Today the Kansas City flood of 1951 has created a picture that words cannot describe. It has become a sad page in history. However, it is gratifying to know that the people who were in it are facing the future in the American way — Smiling!



# GRAIN HANDLING SAFETY PROBLEMS

By C. W. TURNING  
SOGES Safety Director

*A summary of discussions at the Round Table Session on Grain at the National Safety Congress (Grain Handling & Processing Division, Oct. 10, 1951). Presiding: E. F. Gomoll, Safety Supervisor, Clinton Foods Inc., Clinton, Iowa.*

*Question: What design of guard encourages the replacement of guard after it has been removed for repair?*

(a) This delegate suggested that it be a hinged guard with hinges on top. For a pulley or a drive, this would probably be O.K., where they have to take it off to oil. For guarding over belts, a hinge might work only in some cases.

(b) This representative suggested painting the guard a contrasting color. This might help some as you would know the guard was missing because the color shows up.

(c) This man called attention to the fact that many of the guards are entirely too heavy. The workman gets someone to help him take it off, but often there is no one around to help him put it back, and he leaves it stay there. Perhaps these heavy guards could be built in sections so one man could easily handle each section. The method of fastening should also be simple. In some cases he has to reach way around to get at it.

(d) Commented that there are still too many wooden guards. However, when they are in good condition and effective, they are O.K.

(e) This man voiced the opinion that the problem is largely that of supervision. If they don't have to take them off to oil or grease, they are removed only for repairs. It should require the Superintendent's OK to show that the job was completed, which includes the replacement of the guard. We should see that this is done.

The Chairman summarized this discussion as follows: (1) That the guard be of the hinge type if possible, with the hinge at the top. That the guard be painted a color that contrasts sharply with the color of the machine, that the guard be of proper design and if heavy, be made in more than one section to facilitate replacement. That repair job tickets covering guards, not be signed until the Supervisor saw that the guard was replaced.

*Question: What's the best method of cleaning (grain) tanks 130 feet deep?*

The situation was explained as follows: The man enters through a man hole, and is lowered in a Bos'n's chair. The grain seems to catch (or lodge

and every few weeks we have to send a man down there. When sitting in the bos'n's chair it is difficult for him

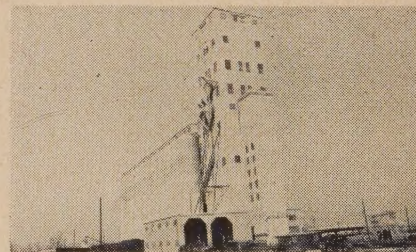
to use a broom or brush to sweep down the stuff. Have been thinking of using some kind of a platform for him to stand on. However, with hand power, it would probably take about 10 or 12 minutes to raise or lower him. Am wondering if we could use an electric winch. He was informed that the manufacturer having a device for this purpose was expected later that afternoon, and it was decided to put the problem up to him.



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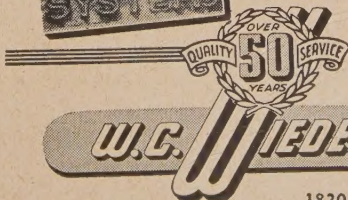
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Comment was made that a man entering such a deep bin would need an air mask or an oxygen mask. That some testing should be done before sending a man down there; among other things a test for hydrogen sulphide gas. Get a sample by testing with litmus paper. In corn products manufacturing, sometimes it is necessary to aerate the tank, top and bottom by mechanical means. Before any man goes into the tank, tests should be made for hydrogen sulphide; that is what we are worried about — it is generated from decomposition. As he enters the tank, keep pumping in fresh air. Equip him with a safety belt, with a man outside the bin, in attendance at all times.

The problem of cleaning solvent tanks was then discussed: First a man goes in with a safety harness, to make the necessary tests. The other men follow, after he ascertains it is safe. He mentioned a tank made in sections, where the sections lacked 3 inches of going to the dome, and allowed fumes to enter other sections; and men were overcome when they returned to work after lunch. This shows the necessity for checking, every time a man goes into the tank.

Also discussed precautions in using cyanide gas for fumigation. One milling company uses it twice a year. "Be sure your gas masks are working, and that the place is aired out thoroughly after fumigating. If you are exposed to it, you can smell it and taste it, and your skin gets 'sun-burned'. You get out of it as fast as you can." Some go in for 30 to 40 minutes and then go out into the open. We use local fumigation on the bins. We check in all employees, and check them all as they go out, to make sure that no one is still in there, before we seal the plant for gas.

*Question: Safe operation of power grain shovels?*

The statement was made that there's a new shovel of the Clark type that has a remote control on it. One member stated that they had experimented with a certain power shovel but took it out. The cable situation was bad. The workmen did not like it. "There should be an automatic shut-off, when he takes his hands off the handle." In every case, there should be proper instructions for the use of the shovel, and provide cables for same.

*Question: Use of paper grain doors on cars going over car dumpers?*

In our opinion they are not a good thing. We don't like them for use with a car dumper. They don't open up right and the paper plugs your cars. It is a slowed-up proposition.

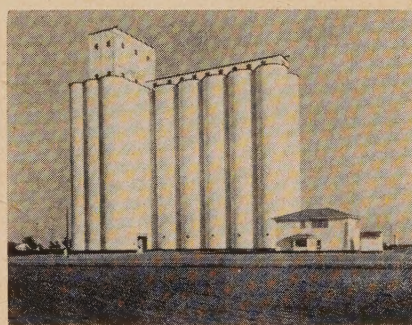
Use of truck dumps was then discussed: This member stated, that they use chocks to block the wheels before dumping the truck. In one certain case the chocks were in good condi-

tion and in proper position. The truck was raised. A man got in with a scraper to clean out the corners and there was another man on the ground. The chocks failed to hold on the truck over-head, and it ran off the dump. It got the other fellow on the ground, carried him 75 ft., to the truck that was waiting behind, to unload. He lost one leg and the other was badly injured.

The device was not successful for unloading trucks with dual wheels. The diameter of the dual wheels was such that when the steel chocks were fully raised, they did not come quite half-way on the dual wheels, and a jar caused the truck to over-ride the wheel chocks. We had the manufacturer come up and we changed the design so that on raised position the top position is at the very center line of the wheels. The brake must be set before the truck is hoisted.

*Question: Method of eliminating falls?*

We use a product known as "Wet or Dry". Falls are an important prob-



Recently completed elevator of Black (Texas) Grain Co. Capacity 450,000 bus.

lem, as falls of one kind or another, represent two-thirds of our accidents. One representative stated "We buy magnesium loading plates and rough them ourselves. Another said he used a small welding machine that spatters steel spots on stairs or steelgrids.

*Question: Window-operation (swing type)?*

One member said they cut off from the length of the notched part so the window does not project too far into the building. The window does not open fully. This window swings both ways — a center hung window. As they rust out, we replace them. Suggest putting windows on the monthly inspection schedule.

Window cleaning is a problem. Some of members said they had outside contractors clean the windows. Discussion followed regarding using swinging stages. One member stated they had a crew of 14 men who do nothing but clean windows.

*Question: What results are obtained in having foremen conduct their departmental safety meetings?*

One party said they set up a sched-

ule for about a year ahead. Every month he gets a report on it. If they postpone a meeting they have to tell him why. He tries to get a foreman to talk to each shift. They hold the men 20 minutes and up to 30 minutes. Every 3 months they hold a department meeting of all shifts. Then they get an outside speaker — movies etc., and get good attendance.

This member stated: Our foremen hold a safety meeting for 5 or 10 minutes every week. We give them a few posters — otherwise, the foremen handle it themselves. These foremen are not given safety training to handle the meeting, but this member makes it a point to be at the meeting if possible. Afterwards he may tell the foreman how he could improve the meeting. First, we get all the foremen together and a program is given them showing what we want. Then each week we give them some additional posters.

Discussion followed in regard to visual aids for such meetings, and it was decided to devote considerable time to preparing foremen meeting cards about 14 x 7 inches (easel type), hinged heavy cardboard, covering suitable subjects for foremen's meetings.

Lights at car unloading or loading docks: One delegate commented on the value of dock plate lights. They light up to let everyone know that the plate is in the car.

Another commented on the value of applying warning signs reading: "Caution in unloading this car. The floor has been patched." It is placed on the grain door and shows up when you open the storm door. An effort will be made to establish the use of such placards as a general practice.

\* \* \*

As the Safety Committee of the Society of Grain Elevator Superintendents is now commencing the long anticipated job of compiling a handbook for Superintendents, Foremen and Safety Committees, on safety and accident problems connected with our type of operations, we ask that you give the above problems your consideration, and let us have your detailed observations on these and any other problems that are peculiar to grain handling and grain processing operations.

We also ask, that if the Safety Committee requests your aid in furnishing data on some specific problem that you lend your best efforts to this task, to enable us to get out something that will be of immediate value and lasting benefit to us all, in our everlasting effort to operate safely, efficiently and without preventable fire losses.

## THE THOUSANDTH MAN

To Tom L. Scott, Supt., Pearlstone Mill & Elev. Co., Dallas, Texas, goes the coveted honor of holding SOGES Membership Card No. 1000, issued this month. Who will be No. 2000?



# Breaking the Accident Chain

By E. O. NETTLETON

Personnel Mgr., B. F. Goodrich Rubber Co. of Can., Ltd.

**YOU AND I** are workers in the Field of Destiny, reaping what has been sown in the past, and sowing what will be reaped in the future. What we do today may well be important to all eternity, and this has very special emphasis where safety is concerned.

The desire for safety is as old as mankind, and man's belief in the supernatural and in many ancient gods grew out of a desire to prevent accidents, and to keep himself safe. Unfortunately many people still believe that safety is largely governed by the supernatural, and that "what is to be, will be," — "when your number is up, there's nothing you can do about it." Such an attitude is several hundred years out of date, and has been disproved by man's own experiences. The trouble is that too few persons have learned the truth about accidents and their causes.

An accident is always the end result of a chain of sequences — it is

the result of a train of events. These are often very complex, and for this very reason many persons say, "Well that wouldn't happen again in a hundred years," or "It must have been intended, or meant to be," or "No one could have foreseen such a thing."

That kind of thinking is dangerous and actually produces most of our accidents today. Once you believe in supernatural causes you won't truly believe that accidents can be prevented. People always act the way they feel and if a person doesn't believe through and through that accidents are preventable, then he won't try half hard enough to prevent them.

How many people still believe in carrying charms, four-leafed clovers, rabbits feet, or horseshoes, as guarantees of good luck and protection against misfortune? Such things belong to another age, but that kind of thinking hinders true accident prevention.

Let us examine a few accidents to

see the peculiar elements that come together to cause them.

- (1) Here's one described by Hon. Harold Scott, Minister of the Ontario Dept. of Lands and Forests.

A hunter was asleep in his car. He had set an alarm clock to wake him at daylight. When the alarm rang, the sleepy hunter awakened with a start, upsetting the clock. In falling, the timepiece struck the trigger of the hunter's gun; it was discharged and the bullet went into a spare gasoline tank, carried in the car. The can exploded, setting fire to the automobile, and the unfortunate hunter was burned to death.

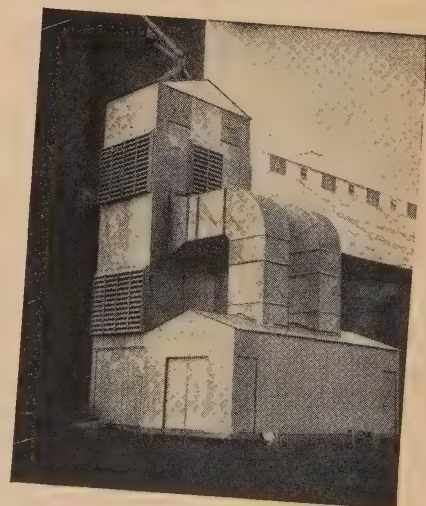
- (2) In Bridgeport, Conn., a box of cookies toppled from a kitchen shelf, and on the way down struck the handle of the water faucet turning on the water. The cookies spilled out and



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**of the thing**

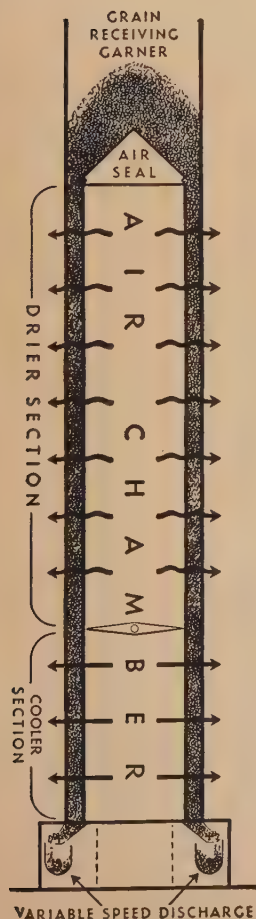
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clogged the drain. The sink overflowed, the water seeped through the floor, a short circuit resulted, and a fire broke out, badly burning the house.

- (3) Fairbanks, Alaska (Oct. 13-50)—It was one of those chain reaction things, so the sad story of Jack Courtney might as well start from the beginning. To enumerate:

- (a) He stopped his jeep by an empty cabin about 47 miles from Fairbanks.
- (b) He drained the watery gasoline out of the jeep and put it into cans he found in the cabin.
- (c) He lighted a cigarette.
- (d) His gloves caught fire.
- (e) He tossed them to the ground where they ignited a small pool of spilled gasoline.
- (f) The gas and glove flames spread to the tires of his jeep, and set them afire.
- (g) Two Fairbanks firemen on their day off drove up, stopped, and prepared to launch into some off-duty firefighting.
- (h) One hopped into the jeep to drive it away from the house — then discovered the jeep was out of gas.
- (i) The other fireman dashed to his automobile to get a fire extinguisher — and discovered he was out of fire extinguishers.
- (j) The flames meanwhile consumed the jeep, then devoured the cabin right down to the last log.
- (k) Courtney hitch-hiked a ride back to town.

- (4) In November 1949 a building, 80 x 130, was completed at a cost of \$43,500. Because the basement had no other ventilation but the staircase, to service the stoker-fired hot water heating system boiler, an air duct was later installed to cool off the basement. This air duct was unthinkingly brought in directly over the city water supply intake. When the temperature outside went down to 15° below zero, things began to happen.

The cold air in the air duct froze the city water in the feed pipe. The pipe broke, permitting water to leak out of the boiler. The boiler thermostats were set at 80°, and the cold air duct kept the temperature so low that the thermostats continued to allow the fire in the stoker to keep burning. There was no stackstat in the combustion chamber of the boiler to shut down the fire. The water became low, overheating the boiler and generat-

ing steam so rapidly that an explosion resulted.

If a safety valve had been installed on the boiler, this steam would have had a means of escaping. These things happened at night when people were not about. Concrete walls were leveled with the street, and the boiler landed 300 ft. away. All glass in buildings and homes within two blocks was broken. Fortunately no one was hurt.

For want of a \$15 safety valve, a \$43,500 loss occurred. But here are the clinch lines. The building was owned by a heating contractor who made all the heating installations himself. A safety valve was required by law on his own boiler. But he sold the safety valve for \$15 to a customer who said he needed it!

- (5) No safety discussion would be complete without a reference to



String of barges loaded with empty grain cars, with towboat in the Mississippi River. The city whose skyline is visible on the other side is Memphis, Tenn.

that great tragedy of the sea which took place April 14, 1912. The R.M.S. Titanic was built to be the safest ship afloat, yet on her very first voyage she was sunk by grazing an iceberg, and this caused the death of 1595 persons. The blame for this tragedy was listed as follows:

The antiquated regulations of the Board of Trade. There were insufficient life boats, but there were all that the regulations required. Steaming straight through ice fields instead of going around them. Failure of the *Californian* to come to the rescue, although she saw the signal flares and was only 12 miles away.

The look-outs were not equipped with binoculars in those days, and if they had been, they would have seen the iceberg in time to turn the boat and miss it.

Now I have purposely chosen ex-

amples of accidents outside of plants because they are of more general interest and will illustrate the principles of accident prevention just as well. In all these accidents, you will say they couldn't have been foreseen, they came totally unexpected, they were the result of many combinations of events, the like of which is unlikely to happen again. But these remarks apply to all accidents, and are often given as the very definition of an accident.

First let us agree on one thing: They are all chains of events, in which there is a primary cause which sets the action going. They are usually complex, and often like Rube Goldberg's cartoons. **But they can all be broken down into five links which form every accident chain.**

Putting these in reverse order, we have:

1. **THE INJURY** — such as fractures, cuts, bruises, infections, strains, sprains, etc. These are the result of,
2. **AN ACCIDENT** which is any occurrence that interrupts or interferes with the orderly progress of the activity. They do not always cause injuries. There are many accidents in which no one gets hurt, but the occurrence of an accident is evidence of **something gone wrong**, of an error or miscalculation. Thus the efficient plant has few accidents. Accidents are usually events such as falls of persons, striking of persons by flying objects, falling objects, stepping on or striking against objects, etc. It should be noted that the words, "Mechanical, Dangerous substances, handling objects, hand tools, transportation," are names of activities in which accidents occur, they are not causes of accidents. Accidents are always caused by the following:
3. **AN UNSAFE ACT and/or A MECHANICAL OR PHYSICAL HAZARD** — Such as, standing under suspended loads; horse-play; removal of guards or safety devices; unguarded nip points, such as gears, moving parts, belts, etc.; insufficient light. These are always the result of,
4. **SOME FAULT OF A PERSON OR PERSONS** —
  - (a) Someone either failed to do something properly, or
  - (b) Did something wrong, or
  - (c) Omitted to do something
 The causes of these can be traced back to,
5. **THE MAN'S ANCESTRY AND SOCIAL ENVIRONMENT** — From his ancestors he gets such traits as recklessness, stubbornness, violent temper, nervousness, excitability. From his social environment he acquires such characteristics as improper attitude, lack of knowledge or bodily



skill, ignorance of safe practices, wilful misconduct, etc.

These are the five links in every accident chain. The injury is caused by the accident, which is caused by an unsafe act and/or a mechanical or physical hazard or a combination of them, and this is caused by some fault of a person or persons, which in turn is the result of an inherited or acquired characteristic. If this accident chain can be broken by removing any of its links, then the accident cannot possibly occur. It is obvious that we cannot do very much with the first two or the last two links of this accident chain, but we certainly can do something with number three.

#### Unsafe Acts of Persons

It has been well established that 85% of all preventable injuries are caused by unsafe acts of persons, and the underlying reasons for the unsafe acts are briefly (1) the man is not convinced that such action is really unsafe, or (2) because the man was not properly and adequately supervised.

Why is it so hard to convince a man that an act is unsafe? Because by the laws of chance he may get away unhurt quite a number of times. Statistics of accident happenings show that for every serious injury or death, there are 29 minor injuries and three hundred times when chances are taken, but no injury occurs.

Perhaps I can better illustrate this by reference to a bottle of pills. There are 330 pills in the bottle, 300 of which are harmless, 29 will definitely cause considerable bodily discomfort, but one is potassium cyanide, a deadly poison. Would anyone take a chance on eating one of these pills — for any amount of gain?

Well every time we rush through a yellow traffic light we are taking the same chance as if we swallowed one of these pills. The chances are largely in favour of nothing serious happening, but the one time you may lose, could be fatal.

We buy lottery tickets where the chances of winning are extremely small, yet each man feels confident he will win, yet we feel we couldn't be so unfortunate as to lose when taking chances with accidents.

Now you may well ask, well what should we do about controlling unsafe acts of persons, how can it be done, if people will continue to take chances? In reply I can tell you what we have done at our plant.

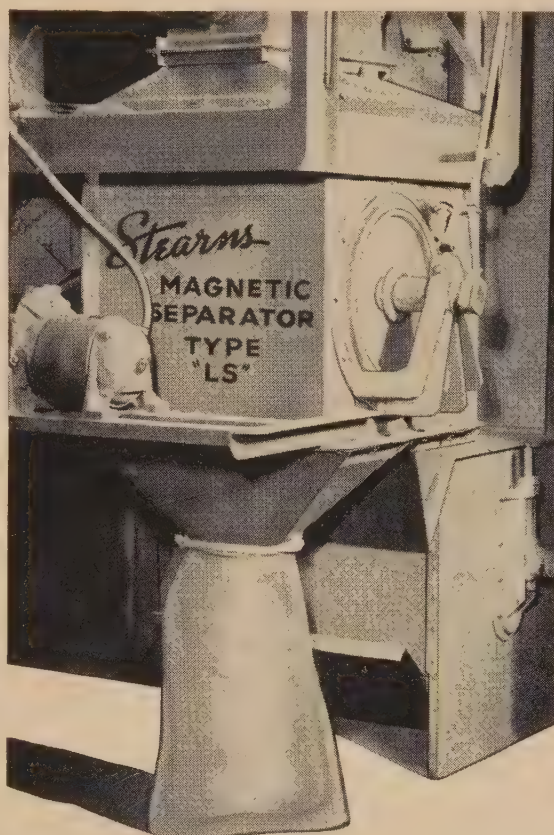
Every supervisor is required to find and correct unsafe practices every day, and to write up each one and turn it in. We originally required 10 unsafe practices to be found and corrected for every injury occurring in a department. These have been highly revealing, and with 500 to 1000 being corrected every month, injuries and

accidents too have fallen away down.

We also require supervisors to make regular personal contacts with each man regarding safety, and we use a steady stream of safety bulletins and messages directed at every employee. In addition we run contests with valuable prizes, for good safety records, and in every way we can keep safety before our people. We teach them all that safety is part of the job. All superintendents meet regularly to discuss safety, to review the reports of accidents and unsafe practices, and to plan what safety measures should be taken. Everyone is taught to report every unsafe prac-

tice or hazard he sees, and prompt action is taken to correct it. No blame is attached to anyone, which encourages people to report on unsafe conditions. Have these measures been effective? Well they certainly have. We just completed 1 million man-hours without a lost time injury, and our average number of employees is in excess of two thousand.

This is the second time in three years we have been able to achieve this record. Prior to adoption of this program of seeking out the unsafe acts of persons, we had anywhere from 25 to 50 lost time injuries every year. Quite recently we averted a



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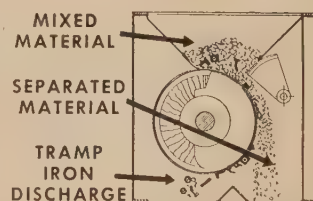
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serious injury simply because the man involved was doing his work in "the safe way" he had been taught, when an accident occurred. The man was not injured, but had he been using an unsafe method he would likely have been killed. We do not know the number of injuries we have prevented by this program, but the great improvement in our safety record is a fair indication of it.

### Simple Things Cause Accidents

There is no Pandora's box out of which our accidents come. There is no virtue in good-luck charms, or horse-shoes or four leaved clovers. Every accident has its origin in a very simple thing. Some small neglect, some error committed by someone, something done wrong or not done at all, is sufficient to start the chain of events that may lead to a very large accident.

It has been said that every fire could at one time have been put out with a half cup of water, and the same logic is true of accidents. They begin in the little things, things so small they escape our notice, but the chain of events they start may be terrible indeed. For that reason every little thing we do may be important for all eternity. There is a similar parallel in the field of medicine, where the life cycle of a disease spreading insect may involve several



"... 496, 497, 498 ..."

different phases in which other animals are used as hosts. The job of the biologist is to find a weak link in the life cycle and break it. It is exactly the same thing with accident prevention, but here we know where the weak link is, and it only remains to break it. To do this requires a little training, but the best possible place to get such training is right in your own particular plants, where the chain of events takes place. To do this, you have to organize, emphasize, and dramatize, then you will realize

the results of true prevention work. — *Before the Industrial Accident Prevention Assn., Toronto, Ont.*

### ACTIVE SOGES CHAPTERS

*Minnesota* — Meets first Tuesday of each month.

*Omaha* — Meets second Tuesday of each month.

*Kansas City* — Meets third Tuesday of each month.

*Buffalo* — Meets third Thursday of each month.

*Chicago* — Meets monthly — alternating first Monday and third Tuesday.

*Pacific Northwest* — Meets quarterly.

### NEW SOGES MEMBERS

995 — E. J. Brazina, Port Authority Grain Terminal, Brooklyn, N. Y., on transfer from Herbert A. Straley.

996 — Robert E. Gooding, Boston Woven Hose & Rubber Co., 111 N. Canal St., Chicago.

997 — Harold Beaver, Supt., Stratton-Theis Grain Co., 1108 Corby Bldg., St. Joseph, Mo.

998 — William R. Fischer, Supt., South Chicago Office, Chicago Board of Trade, Weighing Department, 9152 S. Commercial Ave., Chicago.

999 — Cecil B. Flesher, Nebraska Consolidated Mills Co., Fremont, Nebr.

1000 — Tom L. Scott, Pearlstone Mill



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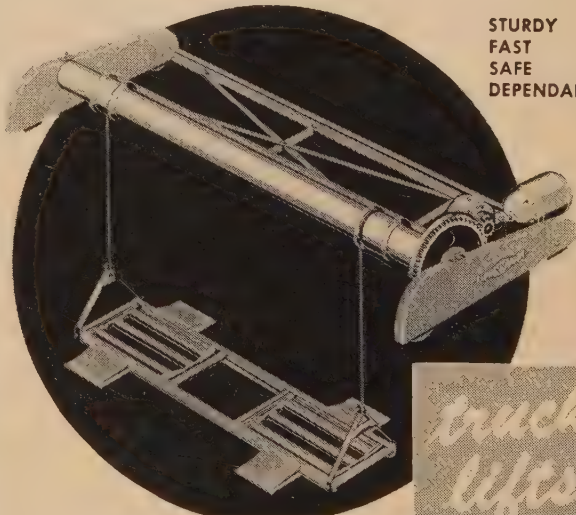
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& Elevator Co., 5316 Fremont St., Dallas, Tex.

1001 — Henry Bunting, Vice Pres., Gordon Chemical Co., Inc., 1100 Hickory, Kansas City.

1002 — R. A. Ford, Manager & Gen'l Supt. of all plants, Canadian Grain Coop, Box 758, Canadian, Tex.

1003 — Ora J. Clark, Supt. of Grain Elevator Dept., Archer-Daniels-Midland Co., P.O. Box 310, Portland, Ore.

1004 — Richard A. H. Richard, Asst. Mgr., Eastern Terminal Elevator Co., Ltd., 1048 Grain Exchange, Winnipeg.

1005 — Stuart Angus McLean, Local Mgr., Continental Grain Co., P.O. Box 838, Longview, Wash.

1006 — Buel Powell, Gen'l Supt., Union Equity Cooperative Exchange, P.O. Box 1306, Enid, Okla.

## THE HONOR ROLL

Not much change has taken place in the leaders of the SOGES Membership Campaign, but several new names have made their appearance. Is your name on the list? Why not get busy and bring in at least one new member. The standing on Nov. 15:

Vincent Blum, Omaha	5
Donald Burke, Omaha	5
Charles J. Winters, New Orleans	3
Harry Ewert, Chicago	2
O. E. Christensen, Portland, Ore.	2
Jerry Lacy, Omaha	2
Earl Mahan, Council Bluffs, Ia.	2
Ernest Ohman, Minneapolis	2
W. R. Appleman, Chicago	1
A. R. Bourdonnay, Ft. Worth	1
O. B. Duncan, Kansas City	1
Vern Erickson, Spokane	1
Lloyd Forsell, Chicago	1
Ralph Garber, Enid	1
John Goetzinger, Omaha	1
Don Halgreen, Amarillo	1
Harry Hanson, Chicago	1
Lewis Inks, Akron	1
A. W. Johnson, Seattle	1
Mark Kaplan, Los Altos, Calif.	1
Jack Kitching, Buffalo	1
Walter Kostick, Minneapolis	1
R. K. Krebs, Kansas City	1
John Mack, Buffalo	1
Lee McGlasson, Seattle	1
Edwin C. Murray, Oakland	1
Ted Musser, Erie, Pa.	1
Kenneth Sacre, Minneapolis	1
Herbert Sales, Omaha	1
Stewart Searle, Jr., Winnipeg	1
Harry E. Surface, Kansas City, Mo.	1
Dale E. Wilson, Chicago	1
Clayton Witham, Kansas City	1

Total 48

"It's a Socialist idea that making profit is a vice; I consider the real vice is making losses." — Winston Churchill.

## Canadian Railroad Adopts New Grain Car Door

Faster unloading and curtailed shipping losses are reported as important features of a new type grain car door to be put in use by the Canadian National Railway Co.

Designed by company engineers, the door is made up of a frame section and four wooden fillers, all 15 in. high and 7 ft. long. The frame section has three paperboard panels which can be replaced after each use. Number of sections used can be varied with height of the car and size of the grain load.

Two thousand cars will be equipped

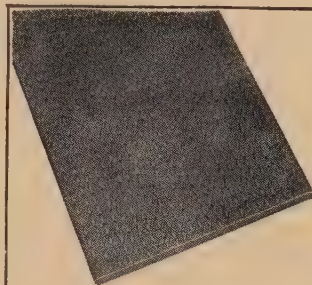
with the new door as soon as an initial order can be filled. The door is said by the company to have stood up well under stringent testing.

## ELBERT SUCCEEDS D'ONOFRIO

Rocco D'Onofrio has severed his connection with Pratt Food Co., Chicago. Emil Elbert has succeeded him as superintendent.

## SEEDBURO INTRODUCES INTER-COM SYSTEM

Just plug Vocatron in the wall socket. Plug the other 1-5 units anywhere else on your wiring system (even in different buildings up to



## Use IMPERIAL BLACK REXALL BELTING

For lowest cost grain leg service

■ Users everywhere report lower costs on grain leg service when they use Imperial's Black Rexall Belts. These unusual service records are due to the special construction of this belting:

Base fabric is heavy 37½-ounce silver duck (finest obtainable), with tensile strength over 700 lb. per inch of width. The tight, dense weave resists pull-out of bucket bolts when a choke occurs. Imperial's special *Inner-locked* stitch positively prevents ply separation.

Special impregnation conditions Black Rexall Belting for grain leg service. The process waterproofs the belt, eliminates troublesome stretch, and reduces slippage. This belting *does not gather static electricity* and is not affected by vegetable oils that disintegrate some belts.

If you buy grain leg belts at lowest cost per bushel, rather than cost per belt, you'll want the facts and figures on Imperial's Black Rexall. Write for Data Sheet 48-2 and complete information.



ANOTHER NEW ELEVATOR using Imperial's Black Rexall Belting is the

Farm Bureau Cooperative Association's modern elevator in Columbus, Ohio.

# Imperial BELTING CO.

1756 S. Kilbourn Ave., Chicago 23, Ill.

ENGINEERED BELTING . . . THE RIGHT BELT FOR EACH JOB



1/2 mile away). No wiring or installation of any kind. Talk and hear on any Vocatron.

The first 10 purchases report that every unit gave excellent service. Like all Inter-Com, Vocatron pays for itself in a few weeks through executive and employee time saved. Cost for two station set is surprisingly attractive.

Write Rex Yocum of 726 Converse Building, Chicago 6, Ill., for complete information.

## PHILLIPS SUCCEEDS COCHRANE

Mel Phillips was appointed Vice-President of the Chicago SOGES Chapter at the last monthly meeting of that body to fill the unexpired term of Ken Cochrane of the NYC Elevator, who left that post to join the Corn States Hybrid Service of Des Moines. Cochrane was formerly Super at that Iowa point for the Iowa Farmers Elevator before coming to Chicago for the same firm. Phillips has long been active in Chapter affairs.

## TEST OF WOOD GRAIN DOORS

To help keep down costs of grain shipments — as well as reduce time in coopering and unloading, the Southern Pine Association plans to encourage further tests of wood grain doors, according to officials. One series of tests, conducted earlier this

# Dust Explosion in New York Elevator

TWO men were blown through a window by a dust explosion on the afternoon of Oct. 19 on the bin floor of the New York Central elevator in West New York. Fire that followed was confined above the bin floor level and completely extinguished in five hours. Shock of the explosion was felt

by all the workers on every other floor.

Paul Ciambrone died in the fall and Antone Slana was injured, saved from instant death by a cushion of tarpaper.

Concrete floors were torn asunder and steel beams were bent and crumpled by the force and heat.

year, already has given evidence that only eight good wood doors per car are adequate to assure safe shipment of grain.

Tests were conducted by the Eastern and Western Weighing and Inspection Bureaus and were witnessed by railway officials. The tests demonstrated that four doors on each side of a car are substantial when the doors are built in accordance with minimum specifications of the AAR, except that in the manufacturing of a door, 100 nails are used instead of the usual 72. The tests emphasized the importance to railroads of requiring that grain doors conform to the requirements of dryness and thickness of lumber used. The maximum moisture limitation should be 19%.

The standard AAR wood grain door was developed many years ago by railroad men to meet specific use requirements. AAR pamphlet No. 36

on "Rules Regulating the Safe Loading of Bulk Grain in Closed Cars" recommends 13 grain doors for coopering cars of 80,000 lbs. capacity. However, many terminals had been receiving cars with as many as 26 doors.

Results of the Southern Pine Association tests showed that eight doors of good dry lumber hold grain firmly in place, preventing excess leakage or bulging.

With only eight doors per car, time will be saved in coopering and unloading. One unexperienced man can cooper an eight-door car in ten minutes. The only equipment he needs is a hammer and 32 - 10d nails.

In one of the tests of wood grain doors, this carload of wheat was shipped from Argentine, Kansas, to Galveston, Texas. There was no leakage from the capacity load. Only eight wood grain doors were used.



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General Manager

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## Car Load Grain Tables

This is a new edition of Clark's Carload Grain Tables extended to cover the largest cars.

Reduces pounds to bushels in 50 lb. breaks from 20,000 lbs. to 140,950 lbs. of 32 lb., 48 lb., 56 lb. and 60 lb. grains.

Pounds in red figures, bushels in black with marginal index.

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Chicago 4, Ill.



## GOING UP!

—Always face the ladder and use both hands going up and coming down.

—Carry small tools in suitable pockets. Hoist larger tools and other objects with rope and bucket.

—When working on a ladder, keep a firm grip with one hand if possible, and do not reach out more than arm's length from the side rail. If necessary to reach farther and the ladder can't be moved, lash the ladder and wear a safety belt.

—Ladders used on roofs or other high places should be lashed securely. Do not leave a ladder standing in a high wind unless it is securely lashed.

—Clean mud or grease from your shoes before using a ladder.

—When a ladder is used in an aisle or on a walk, barricade it or have someone at the base. — *Borden News.*

## Weller Superintendent Dies

Vasile Antoniu, plant superintendent for B. I. Weller Co., elevator cup manufacturers, Chicago died on Oct. 15. He was 69 years old and had been with Weller since 1919, starting as draftsman and working up to superintendent. He had been seriously ill at home only a week, though affected with angina pectoris for some time.

He had no immediate family, although a number of relatives live in Roumania where he was born. A member of the Society of Grain Elevator Superintendents, Mr. Antoniu had many friends in the industry.

## PREVENTIVE SANITATION IN FOOD PLANTS

A supervised operational program to prevent contamination of the product is the essence of preventive sanitation according to J. Carl Dawson, head of J. Carl Dawson & Associates, St. Louis, Mo., sanitation consultants, speaking before the Nov. 5 monthly meeting of the Midwest Section, American Association of Cereal Chemists, at Henrici's Merchandise Mart Restaurant, Chicago.

He told the 60 members and guests that a sanitation program begins with a survey of the plant to find out what is wrong. Sanitation is more than frequent visits of a high-priced exterminator or the use of the perfect fungicide, rodenticide, or germicide.

In a practical, commonsense way, Dawson outlined the two principal sources of contamination, by living things and by non-living things. In the first category came the unsanitary practices of man, the harborage of warm-blooded animals, the entry of insects and flying animals, and the development of micro organisms. In the second group he included dust and dirt which blows in with the air, dirt tracked in by foot and with incoming packages, and dirt devel-

oped through the processing in the plant.

To establish a sanitation program Management must first look to purchasing for sanitary ingredients in packages that will resist contamination. There should be a record of the sanitary condition of incoming packages in the receiving room. Next comes storage in the plant. The storage room should be free of a hodgepodge of unused items which provide harborage for rodents. Keep the storage room cleanable by storing materials away from walls and floor so they can be vacuumed.

There should be regular inspection

of the storage and a record of such inspections. Next comes raw materials, handling equipment, and refillable containers. This is the last inspection point of raw materials before processing.

The production area is the place management tries hard to make look clean. Avoid false ceilings and double walled construction. Frequent and thorough cleaning is important with emphasis on thoroughness rather than frequency. Some common bad practices are nesting of processing containers so that dirt picked up on the bottom of one falls into the other, and plant maintenance such as paint-

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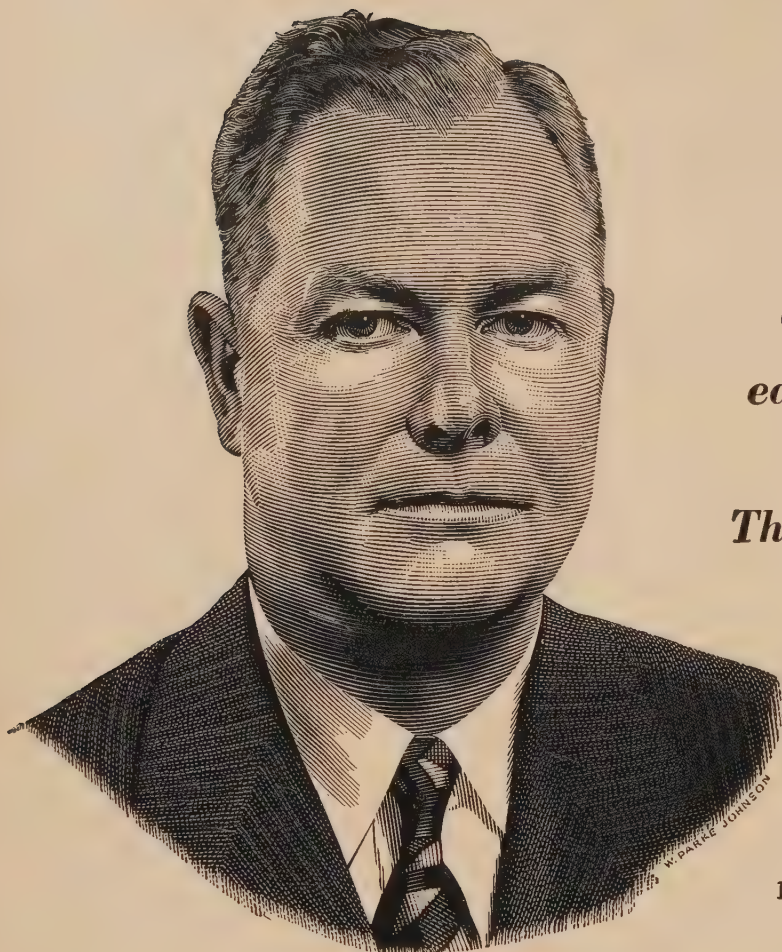
\*Patents Applied for

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President, Allegheny Ludlum Steel Corporation

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- Allegheny Ludlum's person-to-person canvass of employees, which put an application blank for the Payroll Savings Plan in the hands of every man and woman on the company payroll.

• the patriotism and sound sense of the Allegheny Ludlum employees who know that every dollar they invest *each month* in U. S. Defense Bonds is a double duty dollar—it helps to keep America strong . . . it builds personal security for the employee.

If employee participation in *your* Payroll Savings Plan is less than 50% . . . or if you are one of the relatively few industrial companies that does not have a Payroll Savings Plan, phone, wire or write *today* to Savings Bond Division, U. S. Treasury Department, Suite 700, Washington Building, Washington, D. C. You will get all the assistance you may need to place your company among the thousands of companies that have 60, 70, 80%, even 88% participation in the Plan That Protects.

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**GRAIN**





ing or boring holes over uncovered equipment.

The presence of insects in a food plant is an index of its sanitation program.

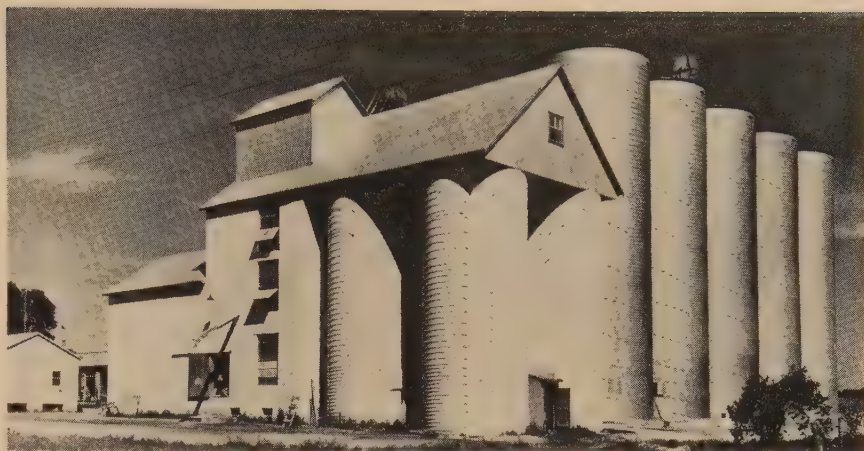
If a jobber or broker in interstate commerce handles a finished product packed by another manufacturer, he should always procure a guarantee statement from the manufacturer that the product complies with the requirement of the Food and Drug regulations.

When a food inspector comes to the plant, management should send its sanitarian and another representative of management with him on the inspection to answer questions and so that a record of what the inspector found is available.

## DELAWARE GRAIN STORAGE

This modern storage system shown on this page was designed and recently completed by The Marietta Concrete Corporation, Marietta, Ohio, for J. E. Churchman & Sons, Clayton, Del. It demonstrates the flexibility of a Marietta storage system and the ease with which additional tanks can be combined with existing units to provide a unified storage system to handle grain, feed or fertilizers.

The first tanks in this Churchman installation were erected in 1948, when four Air-Cell tanks were installed each 14' x 32'6", plus star, with a capacity of 19,000 bus. In



Plant of J. E. Churchman & Son, Clayton, Del.

1950, three tanks, each 22' x 45', were added, to provide storage for an additional 41,000 bus. The latest additions were made this year with the erection of seven 24' x 70' Air-Cell tanks, to give the Churchmans a 14-tank system with a total capacity of 237,800 bus. Air-Cell concrete staves 4 inches thick were used in all tanks. Each tank is circled with rust-proof, steel reinforcing bands for added strength.

The concrete for Marietta Air-Cell staves is made with a lightweight aggregate made by burning and expanding clay. This aggregate is used in place of sand, gravel or stone and produces a concrete that is lightweight, strong, resistant to fire, wind,

acid, freezing and thawing and possesses excellent insulating qualities.

Each Air-Cell stave weighs approximately 60 lbs. and contains five air pockets, or cells, for strength and insulation.

## TWO YEARS WITHOUT ACCIDENT

Iglehart Bros. mill and elevator in Pendleton, Ore., celebrated a National Safety Council industrial award for operating 2 years without an accident, by holding an employees' dinner. Fay Baird, plant superintendent received a commemorative plaque from Gen. Mgr. R. P. Rossming. The last plant accident was on July 6, 1949.

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BOX ENDS**  
Greatest improvement in Screw Conveyor drives. Interchangeable with all old styles.

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BUCKET**  
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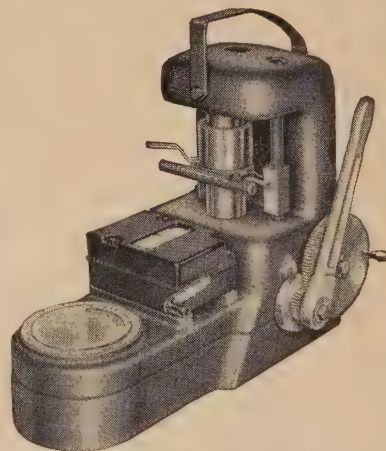
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**Farmers Bank Building  
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## **SOYBEAN PRODUCTS**

*(Continued from Page 6)*

brought to a close and will be reported in more detail at a subsequent meeting.

### **Carbohydrate Constituents**

Sugar has been widely blamed for the discoloration and darkening of soybean phosphatides. On the advice of members of The Soybean Council, a fundamental study was instigated on the carbohydrate constituents of soybean lecithin. Through the use of the comparatively new tool of chromatography, three sugars occurring in soybean lecithin have been identified. These sugars, which account for 85 per cent of the sugar in soybean lecithin, are "free" sugars, that is, they can be removed by physical methods. Other sugars are found to be combined with the phosphatides and can only be removed by drastic chemical treatment. Practical aspects of this more fundamental work, specifically the relationship of sugars to darkening of soybean lecithin, are underway.

### **Soy Powder Problems**

A year ago we presented some preliminary results from our newly organized baking laboratory. Our overall objective in this laboratory is to improve the nutritional value of cereal foods by supplementing or enriching the cereal protein with soy protein; a project the nutritionists have recognized for a long time as of high value to a large segment of the population of the United States.

The more immediate objective is to improve the methods of producing and using soy powder (soya flour) so that its combination with wheat flour will make a loaf of bread the public will like and also one the baking industry will find profitable to produce.

I have used the term soy powder instead of soya flour. A word of explanation is in order. When the word flour is used in discussions, many of us immediately and naturally think of wheat flour with its gluten. This gluten has the unique ability when made into bread of stretching under gas pressure generated by yeast fermentation and of retaining much of that gas in the loaf. Since soy powder does not contain gluten, it does not have this stretching ability.

In order to reach our objectives for soy powder, there are several technical improvements that need to be made. A survey of the Soya Flour Advisory Committee indicated four improvements of primary importance:

1. Color of bread containing soy powder should be improved.
2. Flavor and odor of bread containing soy powder should be made more nearly like present bread.
3. Loaf volumes of bread contain-

ing soy powder should be equal to basic bread or bread containing non-fat dry milk solids.

4. Handling characteristics of dough containing soy powder should be improved to maintain production schedules.

It is quite evident to people who understand baking technology that all four of these factors are important in the modern loaf of bread and to the baking industry. It is an important part of our program to measure as well as we can by experimental baking procedures the magnitude of the above factors and find methods of achieving more perfect loaves.

One phase of our work has been the examination of representative samples of full-fat and fat-free commercial soy powder at a 5% level in the bread formula. Using standard baking procedures, the commercial soy powders were baked with optimum amounts of potassium bromate. The results compared with bread made with 4% special high quality dry milk solids and also with a basic loaf of bread without dry milk solids or soy powder. This type of work has involved the baking of several thousand loaves of bread under rigidly controlled conditions, and it will be some time before the work can be completed and fully evaluated; however, in the meantime we can report the significant trends of our results.

We have arrived at some definite conclusions concerning the effect of soy powder on loaf volume of bread. The average loaf volume obtained when using 6% full-fat soy powder (5% on a fat-free basis) supplied by different producers, ranges from no change at all to a reduction of as much as 8%. The results are in comparison with either the basic loaf or with bread containing 4% non-fat dry milk solids.

When the fat-free soy powder is used at a 5% level, the average loaf volume was slightly above that for the dry milk solids. In fact, 95% of all bread containing the fat-free soy powder had a loaf volume above that containing the dry milk solids.

In comparing the soy powder formula (no milk solids or soy powder), the loaf volume changes were very small. For a majority of the loaves, the change was less than 1% and none of the soy powders tested caused a loss in loaf volume greater than 3%. These results indicate to us that, when a good grade of soy powder is used at a 5% level in bread, there is no change in loaf volume of practical significance to the consumer if the proper level of oxidation is used.

Another factor on which we have obtained preliminary results of an encouraging nature are the taste and odor of bread containing the powder at a 5% level. The experimental bread has been submitted to our



Laboratory personnel along with a simple questionnaire asking their opinion on flavor, odor, and color.

It is quite apparent from this crude method of testing that few people object to the taste of bread containing 5% soy powder, and it further appears that few people can identify the presence or absence of 5% soy powder in bread. It is interesting to note that many of our people, in their critical examination of the bread, have reported too much soy powder when there was none present.

We have also started experiments on the taste problem under more precisely controlled conditions. We are using the so-called triangle test to determine if our people can distinguish between bread containing 5% soy powder from bread with 5% milk solids. This test does not require the individual to identify the soy taste but only to distinguish between three different samples of bread. Our tests have not proceeded far enough for any final conclusions. There are several uncontrolled factors in the taste panel work which we have not had time to evaluate and which might be expected to modify the results. Some of these variables are soybean variety, bread formulation, baking method, and method of processing the soy powder.

Our experience shows that dough handling characteristics are greatly modified by the method of processing the soy powder, such as the amount of steam treatment. Besides proper heat treatment, further improvement is affected by use of optimum amounts of potassium bromate. Further work is in progress. The illustration shows one of the steps in the laboratory procedure where dough handling characteristics are evaluated.

#### Road Oil

Finally, I want to tell about some work that may some day be of direct benefit to all. Large amounts of petroleum are used each year in the oiling of gravel and crushed rock roads. Many of you have probably used such oils on your property, or seen your county or state agents use them on roads. Under many conditions, it is advantageous to use additives to improve the stone wetting characteristics of the oil as well as its retention on the stone.

During the past year we have prepared compounds from soybean fatty acids derived from refining of soybean oil which have promise for this use. We expect to have actual road tests conducted to determine the value of these compounds as additives for road oil. This work is a small part of our long-term research on polymerization of fat acids derived from soybean oil—long-term research which has given us many interesting products.

These products have been reported previously as Norepol, a rubber re-

placement used for a limited period during World War II; Norelac, a polyamide resin used by the Armed Forces during World War II and now being produced commercially in even larger amounts; and dimer acid, a product from the polymerization of fat acids and also in commercial production.—*Before the American Soybean Assn. at Des Moines, Iowa.*

### IN THE HOPPER

Out of curiosity a farmer had grown a crop of flax, and had a tablecloth made out of the linen. Some time later he bragged about it to a woman guest at dinner. "I grew this tablecloth myself."

"Did you really?" she exclaimed. "How did you manage it?" It was plain that she had no idea as to how tablecloths come into being.

The farmer lowered his voice mysteriously. "If you promise to keep the secret, I'll tell you."

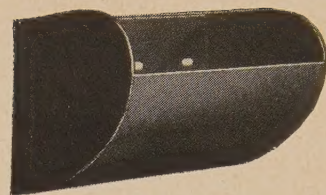
The guest promised.

"Well," proceeded the farmer, "I planted a napkin."

*The teacher was trying to make the pupils think, so asked some tricky questions. "Johnny," said the teacher, "give me an example of 'nothing'."*

*Johnny did not hesitate. "Nothing," he said, "is a balloon with its skin off."*

The new member was quite manifestly trying to impress the older members with her importance. "Yes, my dear," she remarked to the woman sitting next to her, "my ancestry dates back to the days of Charlemagne. How old is your family?"



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Scoops up and fully discharges super capacity loads. No backlegging. Can be spaced closer on belt. Operates efficiently over any size pulley at any permissible speed.

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Or write for capacity data.

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37 Years of Service to The Grain Trade

The older member shook her head. "I really can't say," she replied, slowly and distinctly. "You see, all of our family records were lost in the Flood."

*"Have you ever seen a lie detector in action?"*

*"Seen one! I married one."*

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Located in county seat town of 8,000 pop.  
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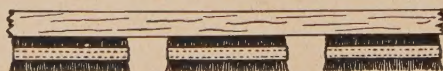


**STAR**

**Warehouse Push Broom**

This is the broom that is used by  
most large terminal elevators for  
sweeping grain out of box cars.

### Quality Separator Brushes



We can furnish highest quality separator  
brushes for any machine.

**WRITE TODAY FOR  
FURTHER INFORMATION**

**FLOUR CITY BRUSH COMPANY MINNEAPOLIS 4, MINN.**

## Grain Elevator For Sale

1 1/4 million bushel capacity grain  
elevator in East Central Michigan.  
Complete. Modern equipment, one  
year old. On C. & O. and N.Y.C.  
tracks (in-transit). 24 acres ad-  
joining land. Presently 60% full.  
Excellent opportunity for profitable  
elevation and storage. Price 45c  
per bushel.

**Call or write: Walter J. Murray,  
Penobscot Bldg., Detroit, Mich.**

### WANTED

Equipment Supply houses to sell na-  
tionally advertised screw conveyor and  
accessories; excellent delivery. **Write  
Box 6-D-6, Grain Magazine, Board of  
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**CORN CUTTER** and Grader—has motor—  
used very little. Write 1-A-16, Grain Maga-  
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**FOR SALE**—Used molasses mixers and used  
California Pellet Mills. Wenger Mixer Co.,  
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**FEED MIXER**—One-ton floor level feed; has  
motor good as new. Write 1-A-17, Grain  
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**FEED MIXER** for sale, has motor, and a  
late machine. Need Space. Will sacrifice.  
Write 1-A-18, Grain Magazine, Board of  
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**FOR SALE** — New No. 0-12 Western Roller  
Screen Corn Cleaner. Write Graham Grain  
Company, 221 S. Fourth Street, Terre Haute,  
Indiana.

**FOR SALE** — Two new Vacuators  
purchased about a year ago but have  
never been used. A truck loading  
cyclone and extra spouting with each  
machine. Hercules gasoline motor on  
each. Box Y-1, Grain Magazine, Board  
of Trade, Chicago 4, Ill.

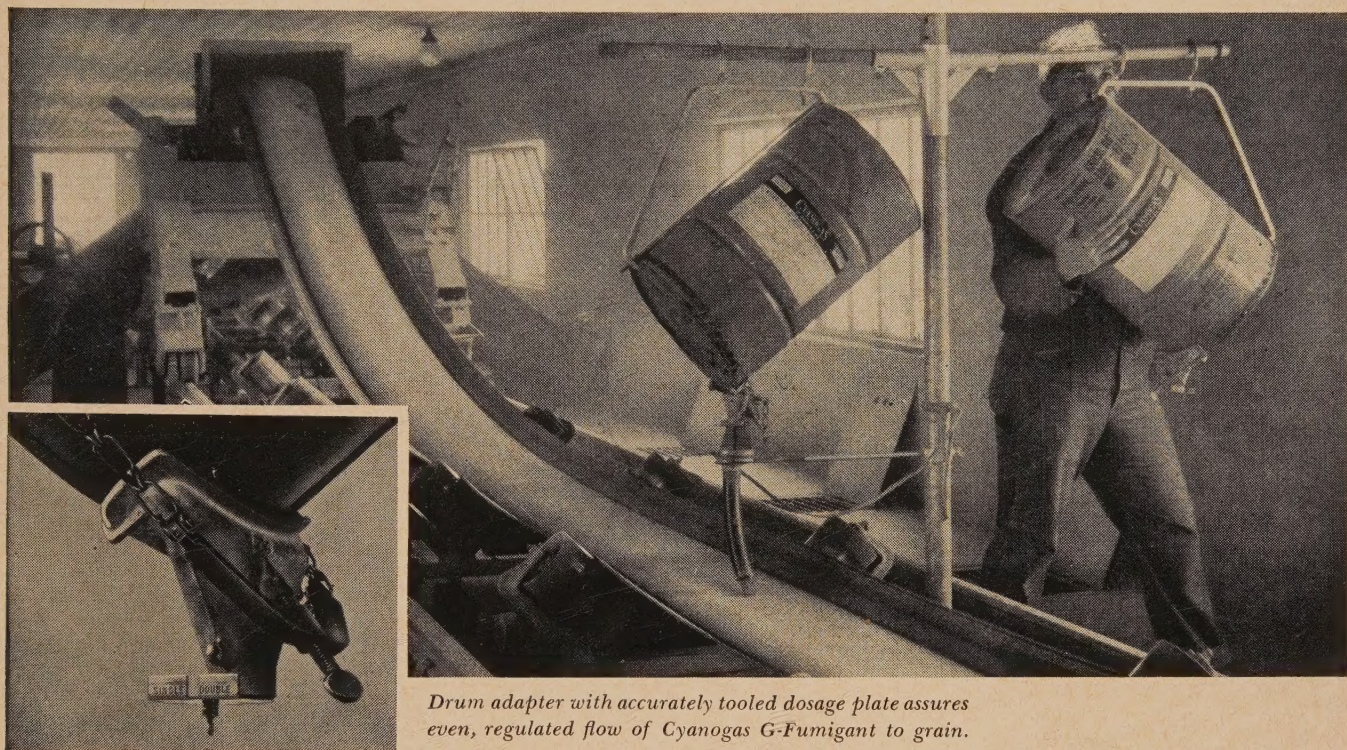
**FOR SALE** — In rich Illinois farming  
community, two grain elevators totaling  
95,000 bushels capacity; also coal busi-  
ness, all for \$30,000 if you hurry.  
Leonard J. Schrader, 509 1/2 E. Green  
St., Champaign, Ill. Phone 9094.

**FOR SALE** — 8-24 ft. lengths of 22  
Gage metal pipe with elbows and steel  
flanges at \$2.00 per ft. Box Y-3, Grain  
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**FOR SALE** — Grain Elevator in corn  
belt area in Northwest Indiana. The  
property is being offered for the un-  
believably low price of \$14,500 (half  
cash) due to ill health of the owner-  
manager. For full particulars, write  
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# Gravity Does Most of the Work When You Fumigate Grain Automatically With **CYANOGAS<sup>®</sup> G-FUMIGANT**



*Drum adapter with accurately tooled dosage plate assures even, regulated flow of Cyanogas G-Fumigant to grain.*

When a CYANOGAS Grain Applicator is installed for application of CYANOGAS G-FUMIGANT to the grain stream, the only attention required is the refilling or replacing of the drum. The free-flowing CYANOGAS is fed *automatically and accurately* to the grain as it flows into storage, making it possible to fumigate as much as 30,000 bushels per hour at an average cost of less than 1/4¢ per bushel.

The hydrocyanic acid gas which is evolved by

CYANOGAS dissipates slowly in the bin, permeating the entire grain mass and killing insects in all stages of development...egg, larva and adult. Grain may be turned or loaded in as little as 72 hours after treatment, *although an exposure of a week or ten days is recommended.*

Our representative will gladly discuss the initial installation of CYANOGAS Grain Applicators and the training of your men in proper fumigation methods. Write for full information.

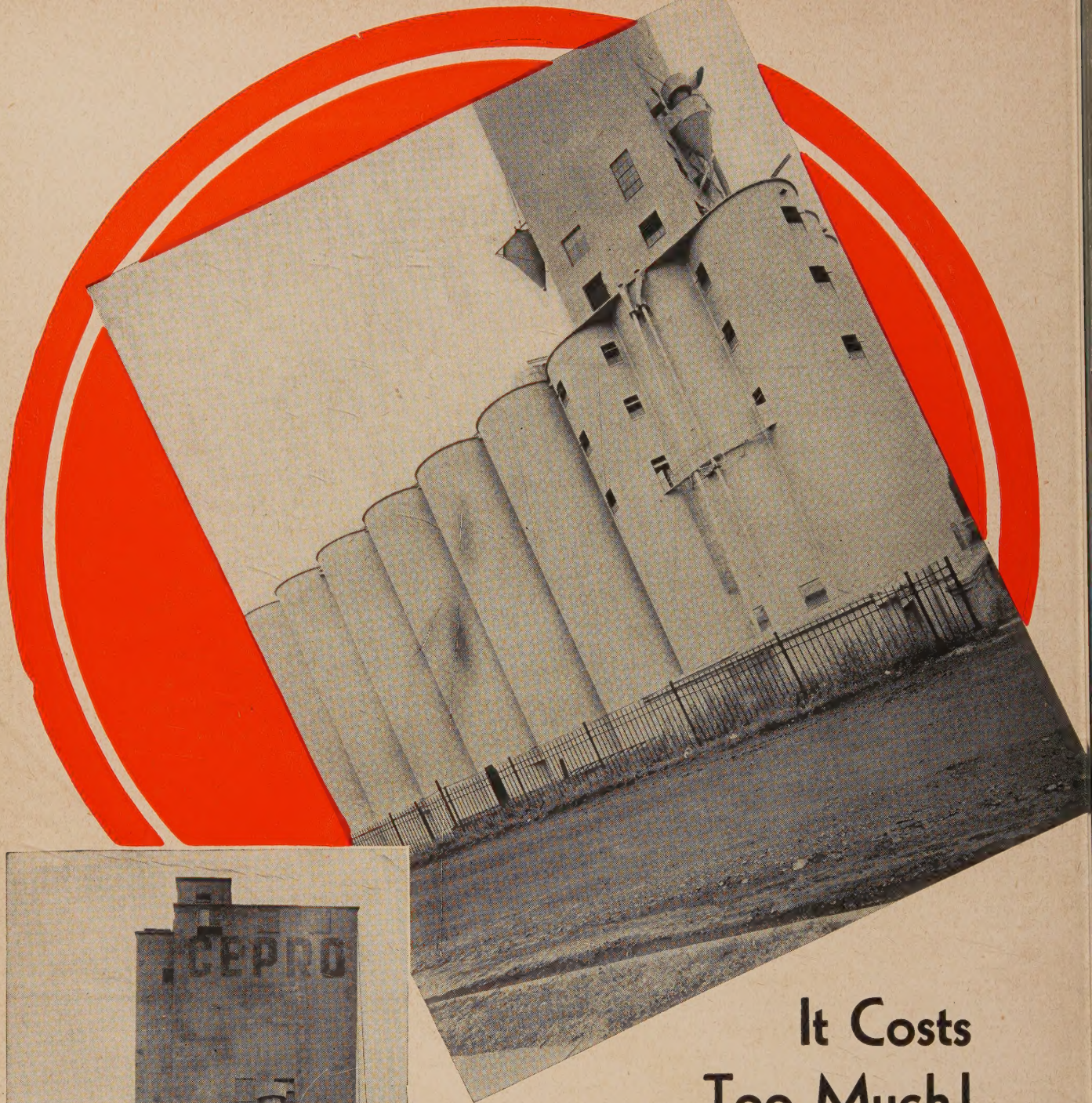
**WHEN USED AS DIRECTED  
CYANOGAS G-FUMIGANT HAS  
NO INJURIOUS EFFECT ON THE  
MILLING QUALITIES OF GRAIN OR  
THE BAKING QUALITIES OF FLOUR**



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